

Original Research Article

An analysis of 644 upper GI endoscopies performed in a Nigerian tertiary health institution

ABSTRACT

Upper GI endoscopy is an important tool in the diagnosis and management of gastrointestinal disorders and is being employed for similar purpose in BSUTH, Makurdi. We sought to audit the practice in this institution over a 7-year period by reviewing the records in the procedural register. We found that most of the indications were diagnostic *in-nature*, with a few therapeutic applications. The diagnostic yield included a spectrum of benign and malignant diseases with GERD, gastro-duodenitis and peptic ulcer disease being the most frequent diagnosis. The therapeutic application included percutaneous gastrostomy tube placement, haemostasis of bleeding peptic ulcers, endoscopic variceal band ligation and sclerotherapy of varices, and gastro-oesophageal foreign body removal. We conclude that routine upper gastrointestinal endoscopy is feasible in our settings though, an overwhelming majority of these is diagnostic as opposed to therapeutic *in-nature*. There is need to expand the scope of endoscopy in our setting. Major challenges need to be addressed to sustain and expand the practice of UGI endoscopy in our setting.

Keywords: Upper endoscopy, diagnostic endoscopy, therapeutic endoscopy, Makurdi.

1. INTRODUCTION

Upper Gastrointestinal Endoscopy (UGIE) or *oesophagogastrroduodenoscopy* (OGD) is an important aspect of daily practice for gastroenterologists, gastrointestinal surgeons and others involved in the diagnosis and treatment of various gastrointestinal disorders[1]. It is arguably the procedure of choice in the diagnosis of mucosal-based lesions of the GI tract as it permits real-time observation of the oesophageal, gastric, and duodenal mucosae, as well as permits diagnostic sampling for further pathologic studies. It also allows for a variety of therapeutic interventions and facilitates early patient recovery due to its minimal invasiveness. The endoscopy capacity in the west-African subregion is suboptimal generally,[2] but OGD is being practised in the major cities in Nigeria[3]. Training in GI endoscopy is also a requirement for certification in general surgery in the West-African sub-region[4]. However, the number of endoscopists in Nigeria is grossly inadequate to cater for the over 200 million population,[5] with the distribution of endoscopists skewed to the major commercial cities where patients can afford such services. In Makurdi, North-Central Nigeria, endoscopy services are available in the two tertiary hospitals within the city and a few private hospitals, with gastroenterologists and general surgeons involved in the practice, similar to most centres in Nigeria[3]. Benue State University Teaching Hospital (BSUTH) is one of the two tertiary hospitals present within the city and serves to provide healthcare services for the inhabitants of Benue and neighbouring states as well as

Comment [U1]: Make it "employed for a similar"

Comment [U2]: Make it "7 years period"

Comment [U3]: First write the full meaning of GERD" Gastroesophageal reflux disease" before you begin using the short forms throughout your entire work

Comment [U4]: Should be "are"

Comment [U5]: Make it "are"

Comment [U6]: Make it "there is a need"

Comment [U7]: Kindly make the single spacing

Comment [U8]: Should be "Oesophago-Gastro-Duodenoscopy"

undergraduate and postgraduate medical training. Endoscopic services commenced within the last decade in this young hospital. ~~The aim of this study~~ is to audit the practice of upper GI endoscopy in BSUTH within ~~a 7-year period~~ 7 years period and review the challenges of ~~practicing practising~~ GI endoscopy in this centre as well as in Nigeria.

Comment [U9]: Delete it and write "This study aims to audit"

2. METHODOLOGY

This was a retrospective study in which data of all endoscopic procedures performed in BSUTH, Makurdi during ~~a 7-year period~~ 7 years period (2014-2021) was obtained from the procedural register. These were collated and analysed using Statistical Package for Social Sciences (SPSS) for ~~windows~~ software version 26. These included patients' demographics and the specific procedure performed as well as the findings. Procedural consent had been obtained for all the study participants before the procedures were done.

Comment [U10]: Make it "Windows"

3. RESULT AND DISCUSSION

There was a slight male preponderance in the study population with a male to female ratio of 1.1:1. ~~Majority~~ of the study participants were in their middle age, with a mean age of 47.0 ± 16.1 (range 10 to 100 years). The pattern of referral indicated that 66.6% of the patients were from BSUTH while 33.4% were referred from other hospitals. In the latter group, 56.3% of the patients were from other government-owned hospitals while 43.7% were from private hospitals. Most of the procedures (634 cases/98.4%) were performed using local anaesthesia (LA) with 1% xylocaine pharyngeal spray. However, 6 cases (0.9%) were done with a combination of LA and moderate sedation while 4 cases (0.6%) required general anaesthesia and airway protection with a cuffed endotracheal tube, administered by an anaesthetist. Common indications for upper GI endoscopy included dyspepsia, GI bleeding, dysphagia, and retrosternal pain. Most (635 or 98.6%) of the procedures done were diagnostic while therapeutic procedures accounted for 1.4% of the total case volume. Findings on OGD ~~was were~~ normal in 134 patients (21.5%), most of which presented with "dyspeptic" symptoms. Multiple diagnosis was made in 125 (20%) patients. The major diagnosis made are as shown in figure 1. ~~Other minor diagnosis~~ Another minor diagnosis which accounted for a small number (40 cases or 6.2%) of the total cases included achalasia, Barrett oesophagus, contracted stomach, duodenal diverticulum, duodenal and gastric tuberculosis, oesophageal ascariasis, oesophageal diverticulum, Kaposi, polyps and oesophageal ulcers, gastric and oesophageal foreign bodies, gastric torsion, and vascular ectasias. The therapeutic procedures done included foreign body retrieval, percutaneous gastrostomy tube placement (Figure 2), haemostasis of bleeding ulcers (Figure 3a & 3b), injection sclerotherapy and endoscopic variceal band ligation of oesophageal varices.

Comment [U11]: Make it "The majority"

Comment [U12]: Please separate the numbers and all the percentages symbols

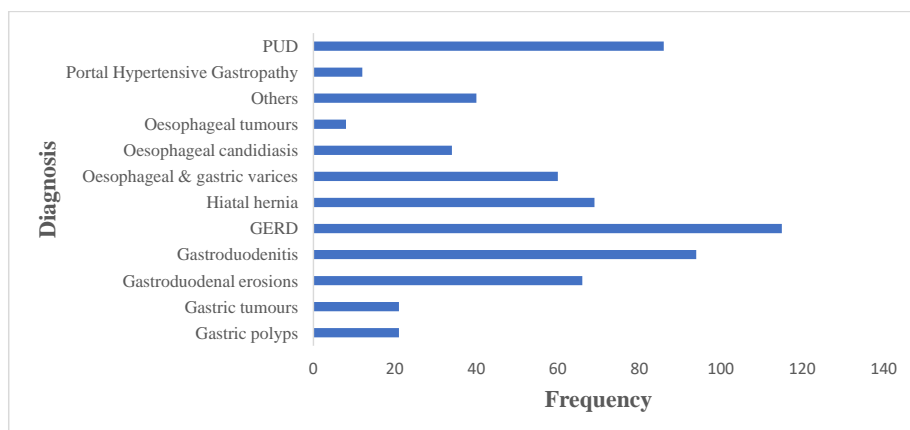


Figure 1: Endoscopic diagnosis and frequencies.



Figure 2: Internal bolster of a PEG tube in situ



Figure 3a: A bleeding visible vessel in a duodenal bulb ulcer

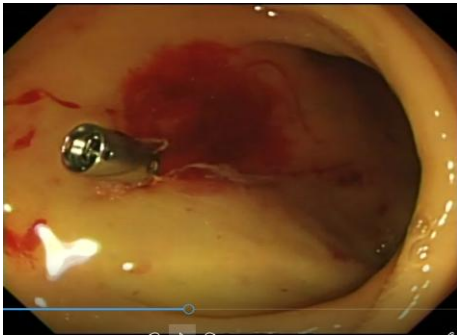


Figure 3b: Clip in-situ, with complete haemostasis

Gastro-oesophageal reflux disease was noted in 17.9% of the study participants, making it the most frequent endoscopic diagnosis made in the study population, similar to findings in another Nigerian study[6]. The prevalence of GERD in Nigeria is 26-33%.[7] However, the reason for the relatively high occurrence of GERD in this study is unclear. Obesity is a recognised risk factor for GERD, and one may postulate that the increasing adoption of western culture and lifestyle in our communities, with increasing prevalence of overweight and obesity,[8] may partly explain this. Another possible explanation is that most local cuisines contain a variety of spices which has been suggested to predispose to reflux.[7] Peptic Ulcer Disease (PUD) gastritis/duodenitis and gastroduodenal erosions were the next most prevalent conditions within this study group. The common aetiologies in these conditions are *Helicobacter pylori* infection, alcohol and tobacco use, and increased stress of daily living. *H. pylori* infection is present in up to 90% of Nigeria's population,[9] and heightened social and physical stress due to rapid urbanization in this region has been well documented[10]. This finding is thus unsurprising and is in concordance with the finding of others.[11] Preventive measures to reduce exposure to these risk factors are required to reduce associated morbidity and mortality. The Widespread availability of testing and treatment for *H. pylori* is also important in this regard. Oesophageal and gastric varices were also commonly diagnosed in the study group, constituting 9.4% of the study population. Alcohol abuse and viral hepatitis infection are the major contributors to chronic liver disease and portal hypertension,[12] which is are mainly responsible for oesophageal varices in this setting. Although the prevalence of viral hepatitis infection appears to be on the decline in Benue state and Nigeria,[13] the same cannot be said of alcohol abuse.[14] The Specific intervention targeted at reducing alcohol abuse as well as further reducing the prevalence of viral hepatitis infection; is therefore required to reduce the incidence of oesophageal varices and its associated morbidity/mortality. Other Another endoscopic diagnosis made reflects the spectrum of benign and malignant diseases of the GI tract in a heterogeneous population, with upper gastrointestinal malignancies occurring in a relatively small proportion (4.7%) of the study population. The high occurrence of normal endoscopic findings in this study, similar to other authors[15], suggests that there is need to review more closely the differentials in patients presenting with dyspeptic symptoms to reduce costs associated with unnecessary OGD and expensive repairs/replacement of endoscopic equipment following wear and tear from excessive use.

Comment [U13]: Make it "have"

There are some challenges in the practice of gastrointestinal endoscopy in Makurdi and these likely mirror the situation in Nigeria. The number of endoscopists available to serve an ever-expanding population is grossly inadequate. This is further worsened by the trending "brain drain phenomenon", whereby skilled medical personnel (including endoscopists) are "lost" to foreign countries in search of better working and living conditions.[16] This heightens the work pressures of the few endoscopists remaining. Secondly, the available infrastructure is inadequate to serve the population. In Benue state of North-Central Nigeria for instance, endoscopy facilities are currently available in only 2 out of the 23 local government areas- Makurdi and Otukpo. This is likely the norm in Nigeria, and Africa, as it has been noted that rural communities have little or no access to endoscopic services[4]. One implication is that in these rural areas, the management of gastrointestinal disorders is still largely done based on presumptions. It is not known what the level of awareness of the importance of GI endoscopy to the management of GI disorders is, in these rural areas, but a lack of necessary infrastructure will likely worsen this. Thirdly, purchase of equipment/ equipment parts, and maintenance of equipment is are problematic. The few available service points are overstretched and frequently breakdown or require replacement of the service parts. Opportunities to do this locally is scarce and these pieces of fragile equipment must be transported overseas for expensive repairs, when necessary, with significant logistics challenges. This increases the cost of such repairs which is associated with a significant downtime and frequent interruptions in practice. The major endoscope providers can improve this situation by establishing service centres and training technicians who can conduct such repairs locally, as noted previously.[17] . Fourthly, accessories for therapeutic interventions are not commonly available, and opportunities to practice and develop skills required for therapeutic endoscopy are limited. The few vendors that import these accessories, offer them for sale at highly exorbitant rates, making their routine use unrealistic for most patients who often purchase these on an out-of-pocket basis. As a result, open surgery is still the predominant approach to commonly encountered GI pathologies that would have been managed endoscopically with attendant morbidity.[18] Fifthly, training opportunities for endoscopists, endoscopic nurses and other support staff are limited. The residency training in General Surgery incorporates GI endoscopy and several short "hands-on" endoscopy courses are run by a few organizations.[18] However, teaching and transfer of endoscopic skills to surgical and other trainees requires to require a consistent, structured, and standardized approach. In a survey of Nigerian surgical residents by Ray-Offor et al.[3] most residents in surgery do not have opportunities to practice GI endoscopy regularly in their training centres. Standard simulators are virtually non-existent and skill acquisition is dependent on practice with willing patients (under supervision by qualified consultants) which is not an ideal scenario. Other challenges are hospital-based and are not limited to the practice of GI endoscopy. These include epileptic power supply, problems with procurement of drugs, disinfectants, detergents and other consumables, poor funding, incessant industrial actions, and inter-professional rivalry amongst healthcare practitioners. It is our view that these challenges need to be addressed to fully leverage on the possibilities of GI endoscopy in our communities.

4. CONCLUSION

In conclusion, routine upper gastrointestinal endoscopy is feasible in our settings with an overwhelming majority of these cases being diagnostic as opposed to therapeutic in nature. GERD is the commonest diagnosis made, followed by gastritis/duodenitis and peptic ulcer disease. Major challenges confront the practice of UGIE in our settings and these should be addressed to sustain and possibly expand the practice.

Comment [U14]: Make it "the availability of infrastructure"

Comment [U15]: Make it "the purchase"

Comment [U16]: Kindly change these fourthly and fifthly things and use other words

Comment [U17]: Kindly change these fourthly and fifthly things and use other words

Comment [U18]: Italic the *et al*

REFERENCES

1. Michael Mwachiro A, Topazian HM, Kayamba V, Mulima G, Ogutu E, Erkie M, et al. Gastrointestinal endoscopy capacity in Eastern Africa. *Endosc Int Open*. 2021 Nov 12;09(11):E1827–36.
2. Perl D, Leddin D, Bizos D, Veitch A, N'Dow J, Bush-Goddard S, et al. Endoscopic capacity in West Africa. *Afr Health Sci*. 2016 Mar 1;16(1):329.
3. Ray-Offor E, Nj J. Flexible Gastrointestinal Endoscopy in Nigerian Tertiary Hospitals: An Audit. *Br J Gastroenterol*. 2019;1(1):116–9.
4. Parker RK, Mwachiro MM, Topazian HM, Davis R, Nyanga AF, O'Connor Z, et al. Gastrointestinal endoscopy experience of surgical trainees throughout rural Africa. *Surg Endosc*. 2021 Dec 1;35(12):6708–16.
5. Nigeria Population (2022) - Worldometer [Internet]. [cited 2022 Apr 4]. Available from: <https://www.worldometers.info/world-population/nigeria-population/>
6. Onyekwere CA, Hameed H, Anomneze EE, Chibututu C. Upper gastrointestinal endoscopy findings in Nigerians: a review of 170 cases in Lagos. *Niger Postgrad Med J*. 2008;15(2):126–9.
7. Akinola MA, Oyedele TA, Akande KO, Oluyemi OY, Salami OF, Adesina AM, et al. Gastroesophageal reflux disease: Prevalence and Extraesophageal manifestations among undergraduate students in South West Nigeria. *BMC Gastroenterol*. 2020 May 26;20(1):1–6.
8. Adeloye D, Ige-Elegbede JO, Ezejimofor M, Owolabi EO, Ezeigwe N, Omoyele C, et al. Estimating the prevalence of overweight and obesity in Nigeria in 2020: a systematic review and meta-analysis. *Ann Med*. 2021;53(1):495.
9. Olokoba AB, Gashau W, Bwala S, Adamu A, Salawu FK. *Helicobacter Pylori* Infection in Nigerians with Dyspepsia. *Ghana Med J*. 2013 Jun 1;47(2):79.
10. Momoh J, Opaluwah A, Albeera H. Challenges Facing Nigeria's Urban Environment: The Abuja Case. *J Sustain Dev Africa*. 2018;20(2):34–49.
11. Malu AO, Okeke EN, Daniyam C. Gastroduodenal diseases on the Jos plateau, Nigeria. *Trans R Soc Trop Med Hyg*. 1994 Jul 1;88(4):413–4.
12. Dolganiuc A. Alcohol and Viral Hepatitis: Role of Lipid Rafts. *Alcohol Res*. 2015 Jun 27;37(2):299.
13. Malu AO, Achinge GI, Utoo PM, Kur JT, Obekpa SA. Prevalence of Hepatitis B Surface Antigen and Antibodies to Hepatitis C in the General Population of Benue State, Central Nigeria. *Am J Trop Med Hyg*. 2020 May 1;102(5):995.
14. Gire JT, Shaahu AI. A qualitative study of alcohol risk perceptions among drinkers in Benue State, Nigeria. *Afr J Drug Alcohol Stud*. 2016 Apr 1;14(2):57–79.
15. Nkrumah KN, Quartey-Papafio JB, Kawanishi M, Archampong EQ. Upper gastrointestinal endoscopy at the Korle Bu Teaching Hospital, Accra, Ghana. *Ghana Med J*.

2007 Mar;41(1):12–6.

16. Adetayo J. A Study of Factors Influencing Brain Drain among Medical Personnel in Nigeria. *Niger J Heal Biomed Sci.* 2010 Oct 14;9(1).
17. Malu A. Gastrointestinal endoscopy in Nigeria. *Niger J Gastroenterol Hepatol.* 2020;12(2):33–9.
18. Ismaila BO, Misauno MA. Gastrointestinal endoscopy in Nigeria - A prospective two year audit. *Pan Afr Med J.* 2013;14(22):doi:10.11604/pamj.2013.14.22.1865.

UNDER PEER REVIEW